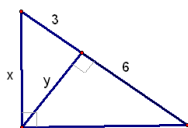


Warm-up!

Solve for x and y.

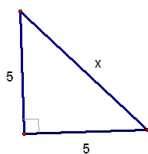
1.



$$\frac{3}{x} = \frac{x}{y} \quad x = 3\sqrt{3}$$

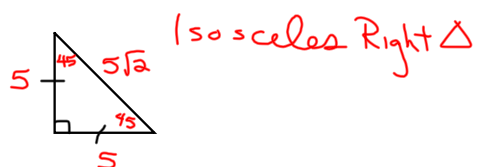
$$\frac{3}{y} = \frac{y}{6} \quad y = 3\sqrt{2}$$

2.



$$x = 5\sqrt{2}$$

7-3 Special Right Triangles

Isosceles Right Δ

$x^2 = 1^2 + 1^2$
 $x^2 = 2$
 $x = \sqrt{2}$

$x^2 = 7^2 + 7^2$
 $x^2 = 98$
 $x = 7\sqrt{2}$

$x = 9\sqrt{2}$


Theorem 7.6--In a 45° - 45° - 90° triangle, the length of the hypotenuse is $\sqrt{2}$ times the length of the leg

45	45	90
x	x	$x\sqrt{2}$
11	11	$11\sqrt{2}$
100	100	$100\sqrt{2}$
55	55	$55\sqrt{2}$
$4\sqrt{2}$	$4\sqrt{2}$	8
$5\sqrt{2}$	$5\sqrt{2}$	10
$6.5\sqrt{2}$	$\frac{13\sqrt{2}}{2}$	13

$$\frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{2}$$

$$= 4\sqrt{2}$$

Equilateral triangle with side of length 10.



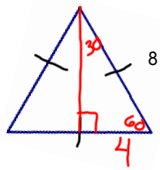
$$10^2 = x^2 + 5^2$$

$$100 = x^2 + 25$$

$$75 = x^2$$

$$5\sqrt{3} = x$$

30	60	90
5	$5\sqrt{3}$	10



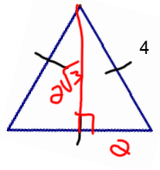
$$8^2 = x^2 + 4^2$$

$$64 = x^2 + 16$$

$$48 = x^2$$

$$4\sqrt{3} = x$$

30	60	90
4	$4\sqrt{3}$	8



30	60	90
5	$5\sqrt{3}$	10
4	$4\sqrt{3}$	8
2	$2\sqrt{3}$	4

Look for a pattern

30 60 90

Theorem 7-7--In a 30-60-90 triangle, the length of the hypotenuse is twice the length of the shorter leg and the length of the longer leg is $\sqrt{3}$ times the length of the shorter leg

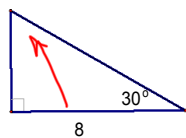


$$\frac{9}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{9\sqrt{3}}{3}$$

$$\frac{12}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{12\sqrt{3}}{3}$$

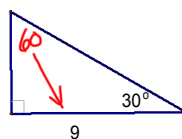
30	60	90
X	$X\sqrt{3}$	2X
3	$3\sqrt{3}$	6
$X\sqrt{3}$ 6	$6\sqrt{3}$	12
7	$7\sqrt{3}$	14
82	$82\sqrt{3}$	164
$3\sqrt{3}$	9	$6\sqrt{3}$
$4\sqrt{3}$	12	$8\sqrt{3}$
$\frac{14\sqrt{3}}{3}$	14	$\frac{28\sqrt{3}}{3}$

30	60	90
X	$X\sqrt{3}$	2X
14	$14\sqrt{3}$	28



$$\frac{8}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{3}}{3}$$

30	60	90
$\frac{8\sqrt{3}}{3}$	8	$\frac{16\sqrt{3}}{3}$



$$\frac{9}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$$

30	60	90
$3\sqrt{3}$	9	$6\sqrt{3}$

What is the perimeter of a square with a diagonal of 16

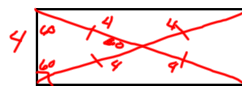
$\sqrt{2}$?



$$P = 64$$

$$\begin{array}{r|rr} 45 & 45 & 90 \\ \times & \times & \times \sqrt{2} \\ \hline 16 & 16 & 16\sqrt{2} \end{array}$$

The diagonals of a rectangle are 8 inches long and intersect at a 60 angle. Find the perimeter of the rectangle.

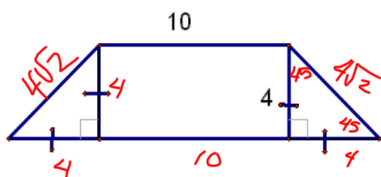


$$\begin{array}{r|rr} 30 & 60 & 90 \\ 4 & 4\sqrt{3} & 8 \end{array}$$

$$P = 4 + 4\sqrt{3} + 4 + 4\sqrt{3}$$

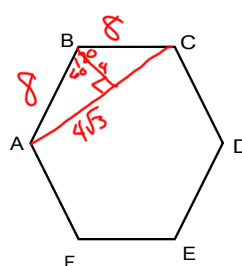
$$P = 8 + 8\sqrt{3}$$

A rectangle and 2 isosceles triangles form the trapezoid below. Find the its perimeter.



$$P = 28 + 8\sqrt{2}$$

In a regular hexagon, $AB = 8$. Find AC and AD .



$$\begin{array}{r|rr} 30 & 60 & 90 \\ \times & \times \sqrt{3} & 2x \\ \hline 4 & 4\sqrt{3} & 8 \end{array}$$

$$AC = 8\sqrt{3}$$

HW
p360-361
12-26